

94 means for producing, from the sensed typing gestures, gesture associated textual output said producing means including a computer and processes running on the computer to capture gesture images, classifying groups of gestures into classes, and associate each of the classes with one of the keys of the virtual keyboard.

REMARKS

In the Office Action, the Examiner rejected Claims 1-22, which are all of the pending claims, under 35 U.S.C. §103 as being unpatentable over the prior art, principally U.S. Patent 5,767,842 (Korth). In particular, Claims 1-3, 7, 8, 10-13 and 17-20 were rejected as being unpatentable over Korth; and Claims 4-6, 9, 14-16, 21 and 22 were rejected as being unpatentable over Korth in view of U.S. Patent 6,421,453 (Kanevsky).

Independent Claims 1, 8, 10 and 17 are herein being amended to emphasize differences between the claims and the prior art. For the reasons set forth below, Applicants believe that the claims as amended herein patentably distinguish over the prior art and are allowable.

The present invention, generally, relates to a method and system for typing using a virtual keyboard. In this method, a person manipulates his or her hands as if that person was typing, and a computer translates that movement into text, as if the person had been typing on a real keyboard.

In this translation, various processes are used. In particular, processes are run on a computer to classify groups of gestures, such as series of hand and finger movements, into classes, and to associate each of those classes with one of the keys of the virtual keyboard.

The prior art of record does not disclose or teach this aspect of the invention.

Specifically, while Korth is an important advancement in the art, this reference provides only a comparatively introductory teaching of the complex process needed to convert hand and finger movement effectively and accurately into the correct key stroke representation.

Kanevsky, et al. teaches a process for analyzing gestures. This reference, though, does not address the specific situation of converting classes of gestures into key stroke representations of a virtual keyboard.

Independent Claims 1, 8, 10 and 17 have been amended to emphasize the above-discussed aspect of the present invention. In particular, Claim 1 is herein being amended to include the limitations that processes, run on a computer, are used to capture gesture images, classify groups of gestures into classes, and associate each of those classes with one of the keys of the virtual keyboard. Claims 8 and 10, which are method claims, are being amended to include the step of running processes on a computer to capture gesture images, classify groups of gestures into classes, and associate each of the classes with one of the keys of the virtual keyboard. Analogously, Claim 17, which is directed to a typing system, is being amended to positively set forth the feature of a computer and processes running on the computer to capture gesture images, classify groups of gestures into classes, and associate each of the classes with one of the keys of the virtual keyboard.

This feature of the present invention is of utility because, as explained in detail in the application, it can be used to convert effectively the hand and finger movements, which can be difficult to analyze accurately, into text.


The other references of record have been reviewed, and they are believed to be no more pertinent than the Korth and Kanevsky references discussed above.

Accordingly, Claims 1, 8, 10 and 17 patentably distinguish over the prior art and are allowable. Claims 2-7 are dependent from Claim 1 and are allowable therewith, and Claim 9 is dependent from, and is allowable with, Claim 8. Similarly, Claims 11-16 are dependent from, and are allowable with, Claim 10, and Claims 18-22 are dependent from Claim 17 and are allowable therewith.

The Examiner is, thus, respectfully asked to reconsider and to withdraw the rejections of Claims 1-22 under 35 U.S.C. §103, and to allow these claims. If the Examiner believes that a telephone conference with Applicants' Attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Applicant also encloses a copy of a "Version with Markings Showing Changes Made", indicative of the amendments which have been implemented to the present application and to facilitate the Examiner's review thereof.

Respectfully submitted,


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Serial No.: 09/603,980

Docket: YOR920000019US1 (13317)

"VERSION WITH MARKINGS SHOWING CHANGES MADE"

THE CLAIMS:

Claims 1, 8, 10 and 17 have been amended as follows:

--1. (Once Amended) An information input processing[, gesture-key mapping] computer system for mapping gestures to keys of a virtual keyboard, the system comprising one or several cameras, one or more memories with CPU connected to the cameras, and processes running in the CPU that associates gesture movements with typing and produce gesture associated textual output, wherein said processes capture gesture images, classify groups of gestures into classes, and associate each of the classes with one of the keys of the virtual keyboard.

8. (Once Amended) The method for producing a textual output in which a user makes typing like gestures without the presence of a keyboard and the gestures are associated with the most probable keys that would be typed if a keyboard were presented, said method including the steps of using a computer system to map gestures to keys of a virtual keyboard, including the steps of running processes on the computer to capture gesture images, classifying groups of gestures into classes, and associate each of the classes with one of the keys of the virtual keyboard.

10. (Once Amended) A method of typing using a virtual keyboard having a multitude of virtual keys, comprising the steps:

- making typing gestures without any real keyboard;
- sensing the typing gestures; and
- producing, from the sensed typing gestures, gesture associated textual output including the step of running processes on a computer to capture gesture images, classify groups of gestures into classes, and associate each of the classes with one of the virtual keys of the virtual keyboard.

17. (Once Amended) A typing system using a virtual keyboard, comprising means for sensing typing gestures made without any real keyboard; and

means for producing, from the sensed typing gestures, gesture associated textual output said producing means including a computer and processes running on the computer to capture gesture images, classifying groups of gestures into classes, and associate each of the classes with one of the keys of the virtual keyboard.